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# Cetacean diagnostic features

*IOTC ROS SFO TR10.3*

Category: Species identification

*IOTC ROS SFO TR10*



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This module aims to familiarize Observers with the main diagnostic features used in the identification of marine mammal species



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## Taxonomic grouping

- Knowing the characteristics of certain groups will help with the identification of species
- Know the list of key characteristics as a starting point
- Species identification is not always possible based on visual limitations whilst at sea
- Identification of families should be possible in most cases



Many whales and dolphin species surface only intermittently and can be difficult to identify at times

Investing time in learning key characteristics of marine mammals and utilising a identification guide is important to ensure a successful identification

Identification down to species level is not always possible, but identification of families of marine mammals should be possible in most cases

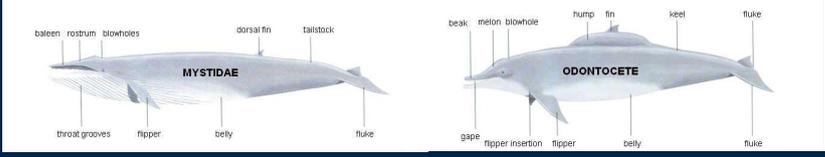
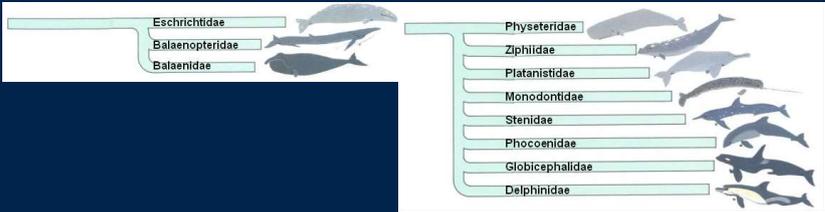


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## Taxonomic grouping

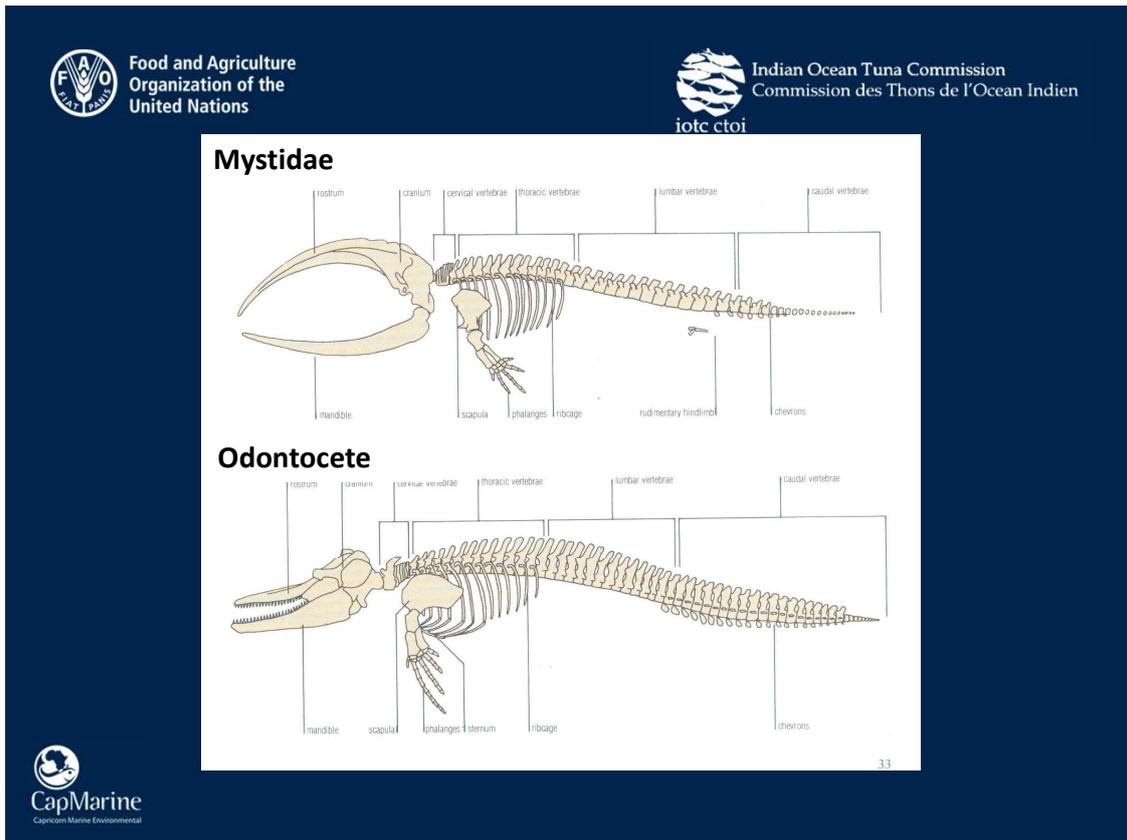
<b>Order</b>	<b>CETACEA - whales, dolphins, porpoises</b>	
<b>Suborder</b>	<b>MYSTICETI</b> baleen whales	<b>ODONTOCETI</b> toothed whales
<b>Family</b>		
<b>Family</b>		



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ORDER – Cetacea is split in two suborders, Mysticeti (Baleen whales) that consist mostly of filter and / or lunge feeders that make up most of the majority of the large whale species.

Odontoceti refer to toothed whales, consisting largely of dolphins and also sperm whales (the only large whale in this order)..



Note the differences in skeletal structure of each sub-order:

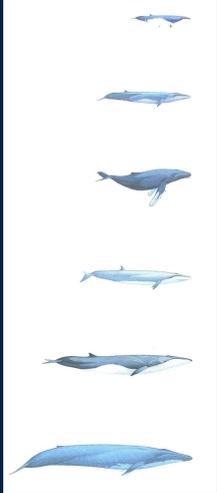
- Mysticete generally have larger heads suited to filtering plankton or for gulping large quantities of bait fish.
- Odontocetes are generally hunters with strong, toothed jaws (mandibles) and powerful tails that can propel them forward at high speed.

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## Baleen Whales

(Mysticetes)



- Double blowhole
- Baleen plates instead of teeth
- Large animals
- Acoustically low frequency specialists
- Highly migratory between feeding and breeding grounds

## Toothed Whales

(Odontocetes)

- Single blowhole
- Variation in size from 2m to 20m
- Variable in form and colouration
- Acoustically mid-frequency specialists with some high-frequency specialists
- Echolocation
- Not as predictably migratory

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Note the main differences in features between the two sub-orders of Cetacea.



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### Taxonomic Grouping – other groups of marine mammal mammals

Order	CARNIVORA seals, walrus, polar bears, sea otters	SIRENIA manatees, dugongs
Family	<p><b>URSIDAE</b>                      polar bears</p> <p><b>MUSTELIDAE</b>                sea otters</p> <p><b>OBENIDAE</b>    walrus</p> <p><b>OTARIIDAE</b>    eared seals</p> <p><b>PHOCIDAE</b>    earless seals</p>	<p><b>DUGONGIDAE</b>                dugongs (1 species)</p> <p><b>TRICHECHIDAE</b>                manatees (3 species)</p>







Sirenians and seals are known to occur in some areas of the IOTC.



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## Dugongs and manatees



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Dugongs and manatees are air breathing mammals.

They are generally solitary animals, however, they are known to congregate in shallow waters and to migrate through brackish water estuaries to new feeding grounds. Both are fully aquatic, mostly herbivorous.

Manatees can grow to over 1000 kg and over 4.5 meters in length. Their normal behaviour is to spend approximately 50% of the day sleeping submerged, surfacing for air regularly at intervals of less than 20 minutes. The remainder of the time is mostly spent grazing in shallow waters at depths of 1 to 10 meters.

Dugongs are also known as "sea cows" directly related to the Elephant. They prefer water no deeper than 10 metres can dive to depths of about 40 metres. Their slow movement and sudden appearance on the surface make them highly vulnerable to fast moving craft.



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## Dugongs and manatees

Extant Order: Sirenia – two genera, four species					
Genus <i>Trichechus</i> (manatees) Linnaeus, 1758 – three species					
Common name	Scientific name	Status	Distribution	Picture	Picture
West Indian manatee	<i>T. manatus</i> Linnaeus, 1758 <a href="#">List of synonyms<sup>[1]</sup></a> <a href="#">[show]</a>	<span style="color: yellow;">VU</span> IUCN			
African manatee	<i>T. senegalensis</i> Link, 1795 <a href="#">List of synonyms<sup>[1]</sup></a> <a href="#">[show]</a>	<span style="color: yellow;">VU</span> IUCN			
Amazonian manatee	<i>T. inunguis</i> Natteier, 1983	<span style="color: yellow;">VU</span> IUCN			
Genus <i>Dugong</i> de Lacépède, 1799 – one species					
Common name	Scientific name	Status	Distribution	Picture	Picture
Dugong	<i>D. dugon</i> Müller, 1776 <a href="#">List of synonyms<sup>[1]</sup></a> <a href="#">[show]</a>	<span style="color: yellow;">VU</span> IUCN			



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Note the worldwide distribution of sirenians, some of them occurring off east Africa and south east Asia and the Indian sub-continent within IOTC.

Dugongs are found up the African east coast with Mozambique hosting the largest East Africa Dugong Population, estimated at 300 individuals that are apparently declining due to loss of habitat and human interaction.



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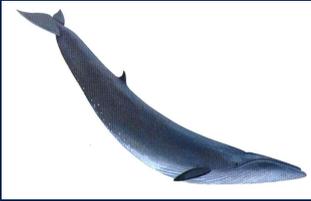
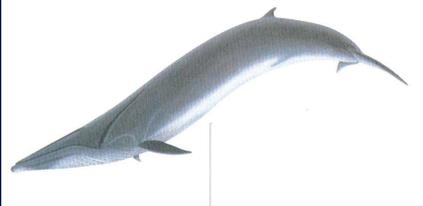
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## Visual cues checklist



1. Size
2. Dorsal fin position, shape, colour
3. Body and head shape
4. Blow characteristics (in larger species only)
5. Fluke shape and markings
6. Surfacing behaviour and dive sequence
7. Breaching and other activities
8. Number of animals observed



9. Geographical location

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Visual cues are identifiable features or behavioural actions of a marine mammal that are seen. In many cases it is the this cue can lead to the most likely identification. Therefore, the visual cue goes hand in hand to the final identification.

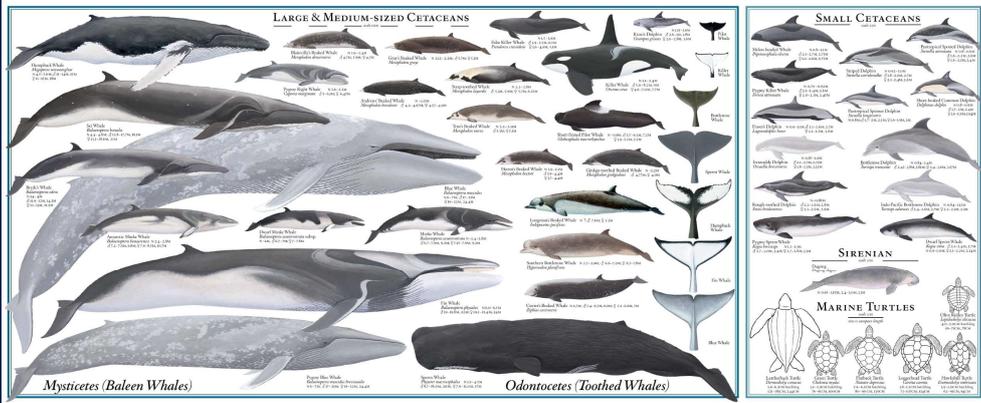
Keep in mind that it may not always be possible to identify an animal to species level but rather to a possible group or class of animal. Essentially we classify this as “Possible” and depending on any specific features notes as “most probable”

These cues can then be used in a process of deduction or elimination to get some idea of the species. It is here, that knowing the anatomy is important. Knowing which parts of the animal you are looking at. The observed cues can then be cross referenced to an ID guide to further assist in identifying the animal.

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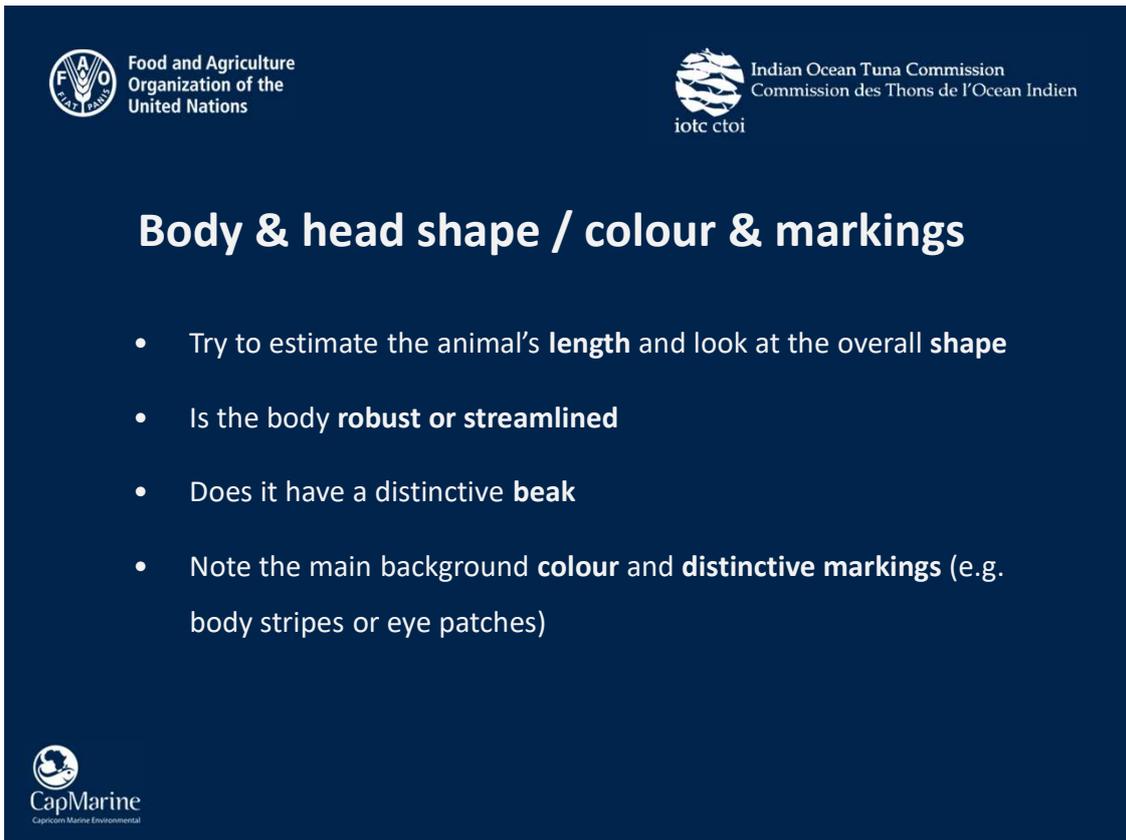
## Size, body & head shape, colour & markings



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ID guides sometimes contain a visual guide to shape and size for comparison.

This may help you in the right direction to find the family to which a potential species identified belongs to.



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## Body & head shape / colour & markings

- Try to estimate the animal's **length** and look at the overall **shape**
- Is the body **robust** or **streamlined**
- Does it have a distinctive **beak**
- Note the main background **colour** and **distinctive markings** (e.g. body stripes or eye patches)

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If you can take a photo of an animal, noting dorsal fin shape or body markings this will be of great assistance to identifying a species.

It is good to focus on a few that are often the most obvious or most likely to be observed:

- probably the first and most important anatomical feature is the overall size of the animal;
- the “blow” from the blowhole is often the first cue and most distinctive to various species;
- the dorsal fin is generally visible at sometime time during a sighting and the size and shape is important; The lack of a dorsal fin is also distinctive for some species;
- the Tail Flukes are also often visible as the animal dives and the feature of the fluke such as the trailing edges and median notch can be noted;
- the flippers on either side should be notes and in some species are very distinctive allowing a positive identification; and
- colour markings may also be visible and quite distinctive in some cases.

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## Dorsal fins

1. Note whether or not the animal has a dorsal fin or hump
2. Look carefully at the **shape**
  - is the base broad or narrow?
  - Is it curved or upright?
  - Is the tip pointed or rounded?
3. Look at the **size** of the fin or hump in relation to the size of the body, its position on the animal's back, its colour and any distinctive markings



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A sight of the dorsal fin of a whale can assist in a positive identification of a whale species. The specific points to note are:

- shape;
- size;
- relative position on the back of the whale between the head and tail; and
- colour.

It is not always possible to see the fin immediately especially on some of the larger whales where the fin is situated far back close to the tail.

In your mind try to divide the animal in half: Then judge the position of the fin from the middle of the back towards the tail. The further back the fin is the harder it is to see and it only appears as the whale arches its back to dive.

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## Dorsal fin characteristics



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Note the variance of the dorsal fin shape top left and bottom right



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## Blow characteristics





- One of the best ways of locating large whales
- An explosive exhalation of a cloud of water droplets
- Followed immediately by inhalation
- Varies in height, shape and visibility between species
- Very distinctive identification feature of different species



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The blow of a whale is often one of the first cues that attracts one to the presence of a whale. It is caused by an explosive exhalation that clears the water in the blowhole.

Especially in more adverse weather conditions when objects on the surface are not easily visible on the surface. The first sighting is often a plume of mist that catches your attention.

Once sighted for the first time the blow provides the opportunity to focus on the area for a fresh blow or sight of some anatomical aspect of the animals.

The characteristics of the blow, height, shape and even angle can also provide some indication of the possible species of whale sighted. Quite specific is the tall vertical (fountain like) blow of the Rorqual whales, which include Humpback and Brydes whales that may be seen in the project area.

- Blow shapes of species such as sperm whales, blue whales make enable observers to locate and potentially identify these species from a very long way away.
- The blow characteristics can be distorted in high wind conditions, but they are a useful surface cue for spotting animals under any weather conditions.



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## Diving sequences

Species	Blow	Surfacing	Diving	Other characteristics
Southern right				
Blue				
Fin				
Sei				
Humpback				
Bryde's				
Sperm				
Minke				
Killer				



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The features of some animals along with their blow shape and body position during the diving sequence can contribute to a successful identification of a species.

With practice, this will become one of the best ways to identify animals

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## Species behaviour:

### Flipper-slapping

- Whales and dolphins may roll over onto their sides or backs at the surface to slap their flippers onto the water with a splash.
- Humpback whales are observed doing this very often



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Flipper slapping, is when a cetacean turns on its side, exposes one or both pectoral fins into the air, and then slaps them against the surface of the water. It is thought to be a form of non-vocal communication. Commonly observed in humpback whales and orcas. The humpback whale's pectoral fin is the largest appendage of any mammal and humpbacks are known for their extremely acrobatic behaviour.

The motion is slow and controlled, and the behaviour can occur repeatedly by one individual over a few minutes

Flipper slapping is common behaviour inshore for some species, but can sometimes be observed in open waters also.

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## Breaching



- A full leap clear of the water, or
- Emergence of only half the body
- Especially common with humpback whales, sperm whales, right whales and dolphins

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"Breaching" takes place when a whale leaps out of the water and falls back with a large splash. With a large whale this is a noticeable event taking into consideration about 10 ton of animal coming out of the water and falling back.

Dolphins regularly travel forwards repeatedly jumping out of the water. Also called "Porpoising" where they arc out of the water but remain mostly horizontal while travelling at speed. Often seen when dolphins approach a vessel to bow-ride

This is a good opportunity to observe body features of cetaceans – flipper length and shape, colours and marking, dorsal shape and body size. If you see a whale breach, check in your ID guide if your potential ID matches the species behaviour in your guide.

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## Lobtailing (tail-slapping)

- Forceful slapping of the flukes against the water
- May be repeated many times in a row



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Lobtailing is the act of a whale or dolphin lifting its fluke out of the water and then bringing them down onto the surface of the water hard and fast in order to make a loud slap. Large whales tend to lobtail by positioning themselves vertically downwards into the water and then slapping the surface by bending the tail stock. Dolphins like killer whales tend to remain more horizontal.

All species are likely to slap several times in a single session and it is common behaviour amongst the more active whale species such as sperm whales, humpback, right and killer whales.



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## Fluking

- When some whales and dolphins are about to dive deeply, they lift their tails into the air to help them thrust their bodies into a steeply angled descent.
- A good opportunity to see the shape of the flukes







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Sperm whales, humpback whales and killer whales often fluke and present a good opportunity for the identification of certain species

When some of the larger whales are about to dive deeply, they go into a diving sequence and first arch their back and then lift their tails into the air to help thrust their bodies into a steeply angled descent. "fluking" is the term when its tail breaks the surface."

The dive sequence may also be characteristic to some species. With the larger whales this is quite a slow process and a good opportunity to see the position of the dorsal fin and shape of the tail. Note terminology such as the median notch that are often referenced in ID guides

In some cases the diving sequence can give some indication of the species of whale. Some whales lift their tail high out of the water so that the whole stock and tail are visible, for example a Humpback Whale. Others only just show the tail and in the case of the fin whale the tail does not break the surface at all.

Fluking is also the term used when some species literally float head down with their tails protruding above the surface.



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## Spyhopping

- Many cetaceans occasionally poke their heads out of the water to look around
- Rise slowly upwards until their eyes are just visible, may turn in a circle and then slip back below the surface



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"spyhopping" when it raises its head as if to look around. It is a slow process until their eyes are just visible, may turn in a circle and then slip back below the surface.



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## Logging

- A group of cetaceans seen at the surface, floating motionless and all facing the same direction
- A form of rest
- Typical behaviour displayed by sperm whales and pilot whales



Logging is a behaviour that whales exhibit when at rest and appear like "logs" at the surface. It is defined as lying without forward movement at the surface of the water with the dorsal fin or parts of the back are exposed.

Whales often rest for periods of time under the surface in order to sleep in mainly horizontal positions so they can continue to breath. Sperm whales also rest on the surface after a very deep dive. Other species that log regularly are the two *Kogia* sp. (dwarf and pygmy sperm whales)

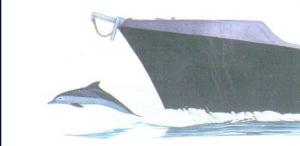


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## Bow-riding & wake-riding



- Wake-riding: swimming in the frothy wake of a ship
- Bow-riding: riding the bow-waves of a ship where they can be pushed along by the force of the wave



Dolphins bow-riding is a good opportunity to observe patterns and lines around the dorsal area, saddle and also to observe the tail shape (see ID guide)



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# ANY QUESTIONS?



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